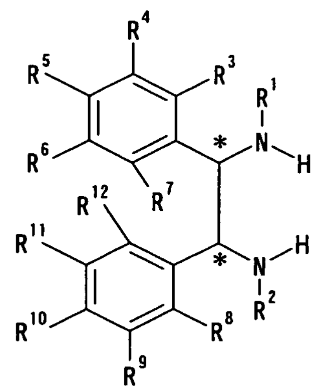
What is claimed is:

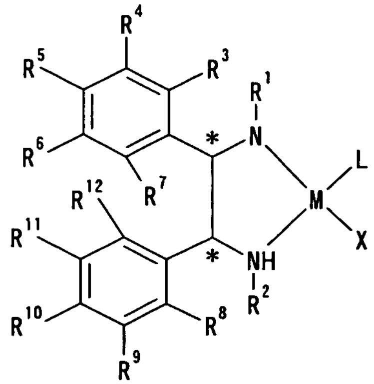
[1] An optically active diamine compound represented by the formula (1):



(1)

wherein R^1 and R^2 each independently represent a hydrogen atom, an optionally substitued hydrocarbon group, or $-SO_2R^{13}$ (wherein R^{13} represents an optionally substituted hydrocarbon group, a camphoryl group, or a substituted amino group), R^3 to R^{12} each independently represent a hydrogen atom, an optionally substituted hydrocarbon group, an optionally substituted heterocyclic group, an optionally substituted alkoxy group, an optionally substituted aryloxy group, an optionally substituted aralkyloxy group, or a substituted amino group, and * represents an asymmetric carbon atom, provided that at least one of R^3 to R^7 and R^8 to R^{12} is a substituted amino group.

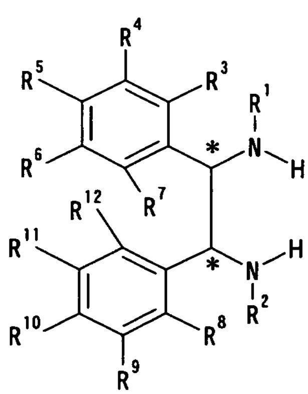
[2] An optically active transition metal-diamine complex represented by the formula (2):



(2)

wherein R^1 and R^2 each independently represent a hydrogen atom, an optionally substituted hydrocarbon group, or $-SO_2R^{13}$ (wherein R^{13} represents an optionally substituted hydrocarbon group, a camphoryl group, or a substituted amino group), R^3 to R^{12} each independently represent a hydrogen atom, an optionally substituted hydrocarbon group, an optionally substituted heterocyclic group, an optionally substituted alkoxy group, an optionally substituted aryloxy group, an optionally substituted aralkyloxy group, or a substituted amino group, M represents a transition metal, X represents a halogen atom, L represents a ligand, and * represents an asymmetric carbon atom, provided that at least one of R^3 to R^7 and R^8 to R^{12} is a substituted amino group.

[3] An optically active transition metal-diamine complex obtained by reacting an optically active diamine compound represented by the formula (1):



(1)

wherein R^1 and R^2 each independently represent a hydrogen atom, an

optionally substituted hydrocarbon group, or $-SO_2R^{13}$ (wherein R^{13} represents an optionally substituted hydrocarbon group, a camphoryl group, or a substituted amino group), R^3 to R^{12} each independently represent a hydrogen atom, an optionally substituted hydrocarbon group, an optionally substituted heterocyclic group, an optionally substituted alkoxy group, an optionally substituted aryloxy group, an optionally substituted aralkyloxy group, or a substituted amino group, and * represents an asymmetric carbon atom, provided that at least one of R^3 to R^7 and R^8 to R^{12} is a substituted amino group;

and a transition metal compound represented by the formula (3):

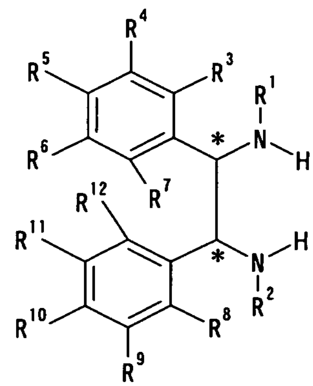
$$[MX_mL_n]_p \qquad (3)$$

wherein M represents a transition metal, X represents a halogen atom, L represents a ligand, m represents 2 or 3, n represents 0 or 1, and p represents 1 or 2.

[4] A catalyst for asymmetric synthesis comprising the optically active transition metal-diamine complex according to claim 2 or 3.

[5] The catalyst for asymmetric synthesis according to claim 4, wherein the catalyst for asymmetric synthesis is a catalyst for asymmetric reduction.

[6] A catalyst for asymmetric synthesis comprising an optically active diamine compound represented by the formula (1):



(1)

wherein R^1 and R^2 each independently represent a hydrogen atom, an

optionally substituted hydrocarbon group, or $-SO_2R^{13}$ (wherein R^{13} represents an optionally substituted hydrocarbon group, a camphoryl group, or a substituted amino group), R^3 to R^{12} each independently represent a hydrogen atom, an optionally substituted hydrocarbon group, an optionally substituted heterocyclic group, an optionally substituted alkoxy group, an optionally substituted aryloxy group, an optionally substituted aralkyloxy group, or a substituted amino group, and * represents an asymmetric carbon atom, provided that at least one of R^3 to R^7 and R^8 to R^{12} is a substituted amino group; and a transition metal compound represented by the formula (3):

$$[MX_mL_n]_p \qquad (3)$$

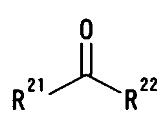
wherein M represents a transition metal, X represents a halogen atom, L represents a ligand, m represents 2 or 3, n represents 0 or 1, and p represents 1 or 2.

[7] The catalyst for asymmetric synthesis according to claim 6, wherein the catalyst for asymmetric synthesis is a catalyst for asymmetric reduction.

[8] A process for producing an alcohol, which comprises subjecting a ketone to an asymmetric reduction in an aqueous solvent in the presence of the catalyst for asymmetric reductionof claim 5 or 7.

[9] The process according to claim 8, wherein the ketone is a prochiral ketone, and the produced alcohol is an optically active alcohol.

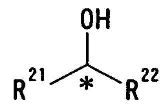
[10] The process according to claim 9, wherein the ketone is a ketone represented by the following formula (4):



(4)

wherein R^{21} and R^{22} each independently represent an optionally substituted hydrocarbon group, an optionally substituted heterocyclic group, or a ferrocenyl group, provided that $R^{21} \neq R^{22}$, and R^{21} and R^{22} may be bonded to each other to form a cyclic ketone having a substituent, and the resultant

optically active alcohol is an optically active alcohol represented by the following formula (5):


(5)

wherein * represents an asymmetric carbon atom and R^{21} and R^{22} are the same as described above.

[11] The process according to any one of claims 8 to 10, wherein the asymmetric reduction is based on asymmetric transfer hydrogenation.

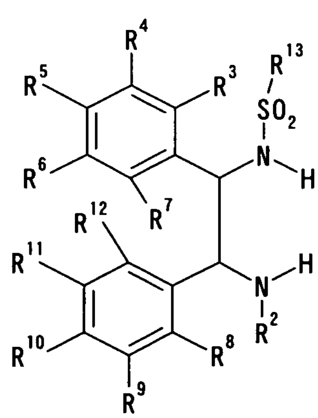
[12] The process according to any one of claims 8 to 11, wherein the catalyst for asymmetric reduction is recovered after use.

[13] The process according to claim 12, wherein the recovery is performed in the form of an aqueous solution.

[14] The process according to any one of claims 8 to 13, wherein the recovered catalyst for asymmetric reduction is recycled.

[15] The process according to claim 14, wherein the recovered catalyst for asymmetric reduction is a catalyst to be recycled in the form of the recovered aqueous solution.

[16] A diamine compound represented by the formula (1b):


(1b)

wherein R^2 represents a hydrogen atom, an optionally substituted hydrocarbon group, or $-SO_2R^{13}$ (wherein R^{13} represents an optionally substituted hydrocarbon group, a camphoryl group, or a substituted amino group), R^3 to

R^{12} each independently represent a hydrogen atom, an optionally substituted hydrocarbon group, an optionally substituted heterocyclic group, an optionally substituted alkoxy group, an optionally substituted aryloxy group, an optionally substituted aralkyloxy group, or a substituted amino group, and R^{13} represents an optionally substituted hydrocarbon group, a camphoryl group, or a substituted amino group, provided that at least one of R^3 to R^7 and R^8 to R^{12} is a substituted amino group.